Occupational Skin Diseases in the San Francisco Bay Area

GERALD A. GELLIN, M.D., C. RICHARD WOLF, M.D., AND THOMAS H. MILBY, M.D., *Berkeley*

■ *From answers by one-third of the practicing dermatologists in the San Francisco Bay Area to a questionnaire on occupational skin diseases, contact dermatitis due to irritants and sensitizers was found to rank first. Poison oak, which is the leading* REPORTED *cause on "Doctor's First Report of Work Injury" received by the California Department of Industrial Relations, was sixth on the list of the survey, trailing solvents, cleansing agents, petroleum products and epoxy resins. A history of atopic dermatitis was often noted in current cases of occupational diseases of the skin.*

Avoidance of exposure or limiting the contact with pathogenic substances—through engineering changes, observation of working conditions by physicians, education of workers—appeared to be the best preventive measures.

INASMUCH AS SKIN DISEASE is the leading reported occupational illness in California,[1] inquiry was made into the clinical experience with this problem by practicing dermatologists in the San Francisco Bay Area. The information sought pertained mainly to diagnostic features and preventive measures.

Fifty of the approximately 100 board-certified dermatologists with offices in the San Francisco Bay Area were sent questionnaires in October, 1969. Thirty-two forms were returned (64 percent). The counties included in this survey were Alameda, Contra Costa, Napa, San Francisco, San Mateo, Santa Clara and Solano.

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All "Doctor's First Reports of Work Injury" for 1968, filed with the California Department of Industrial Relations from all counties, were screened and tabulated for skin diseases.

The Questionnaire

The questionnaire was as follows:

1. In the course of the average week, how many cases do you examine that fit the description of an occupational skin disorder?

(The definition offered included any skin abnormality — inflammation, pigmentary alteration, benign or malignant tumor — produced or aggravated during the course of performing the duties of the job.)

2. What proportion of these patients have lost time from work?

3. What are the causes defined by you among these patients?

Please list in order of frequency, if possible.

4. Were patch tests employed?

5. What other diagnostic aids, if any, were helpful?

6. Which of the following, if any, did you consider to be predisposing factors: sex, age, skin color, skin texture, prior or coexistent skin disease?

7. What preventive measures, if any, did you recommend?

8. Has the assistance of county or state occupational health agencies been used to clarify causes and conditions responsible?

9. Do you have any recommendations that might be implemented to assist in the prevention and elimination of occupational dermatoses?

Results

Answers to the questionnaire were as follows:

1. *Average number of cases seen per week:* Two-thirds (21) of the physicians see an average of one to three cases a week. One-fourth (eight) of the dermatologists average from four to fifteen such patients a week (Table 1).

2. *Workers with occupational skin disease leading to lost time:* All surveyed physicians see patients who have lost time due to their skin disease. The proportion of such cases in the individual practices ranges from 5 percent to 100 percent. Among those who report seeing the largest number of industrial cases (ten to fifteen a week) the proportion varies from 10 percent to 50 percent. The two physicians who report seeing only lost-time cases average from one to three such patients a week.

3. *Causes of occupational skin disease:* Contact dermatitis is the major diagnosis made by all respondents. Equal blame is placed on irritants and sensitizers. In addition, two physicians blame trauma as a cause, and seven cite infection (paronychia, in three instances). Eight specific substances or groups of substances are singled out sufficiently often to rank in descending order of frequency (Table 2). Other causal factors are: water exposure (wet work), cement, chromates, rubber additives, plastic components, disinfectants, food juices, metals and chemicals (not otherwise identified). One physician includes prolonged sun exposure as a cause of occupational related actinic damage to the skin.

4. *The use of diagnostic patch testing:* Of the 31 respondents, 27 employ patch tests (open and closed) to aid in the diagnosis of allergic contact dermatitis. One of the four physicians who does not patch-test, had done so in the past but found it "rarely of value."

5. *Diagnostic aids to establish the diagnosis of occupational skin disease:* A careful work history is mandatory. The course of the rash following removal of the suspect cause, or the worker from the job may provide helpful clues. Adjuncts used by a third of the dermatologists are fungal studies of skin scrapings, and, at times, skin biopsy. For primary or secondary bacterial infection, culture and sensitivity studies are advised. Only one physician cited the clinical appearance of the dermatitis as being of special diagnostic value.

6. *Predisposing factors:* Over two-thirds of the physicians said that the major predisposing factor is the presence or history of eczema, particularly atopic dermatitis. Other dermatoses cited are nummular eczema, dermatophytosis, palmar psoriasis, and non-occupational contact dermatitis. A dry, fair-complexioned skin is listed in five responses as a possible predisposing factor. Although one physician suggests that Negro skin offers some protection from irritants, he adds that it is probably not significant. The tendency of the younger worker to protect his skin less than his more ex-

TABLE 1.—*Weekly Average Number of Patients With Occupational Skin Disease Seen by 32 Dermatologists in the San Francisco Bay Area*

No. Cases	*No. Physicians**
0	2†
Less than 1	7
1 to 3	14
4 to 6	4
7 to 9	1
10 to 15	3
	31

*One physician did not answer this question.

†One of these physicians no longer does industrial work.

TABLE 2.—*Eight Leading Causes of Occupational Contact Dermatitis, in Descending Order, Reported by 31 Dermatologists in the San Francisco Bay Area*

Solvents
Alkalis (for example, detergents and cleansers)
Lubricants, oils, and greases
Epoxy resins
Cosmetics (that is, as used by beauticians)
Plants (for example, poison oak)
Acids
Cutting fluids

TABLE 3.—*Ten Leading Causes of Reported Cases of Occupational Skin Diseases in California—1968*

Cause	RANK ORDER: San Francisco Bay Area (7 counties)*	RANK ORDER: Statewide
Poison Oak	1 (765)	1 (3,109)
Miscellaneous chemicals, mainly unspecified	2 (257)	2 (1,457)
Water, soaps, detergents and other cleaning compounds	3 (217)	3 (940)
Solvents	4 (171)	4 (876)
Plastics	5 (90)	5 (673)
Alkalis	6 (61)	
Agricultural chemicals	7 (57)	9 (367)
Cement, mortar, plaster, not as dust	8 (54)	
Petroleum products, not used as solvents	9 (51)	6 (639)
Inedible plant and animal products, except poison oak	10 (49)	10 (310)
Glass dust		7 (439)
Fruits, nuts, vegetables		8 (380)
All reported cases, 1968	2,487	13,697
Ten Leading Causes, proportion of all cases	71%	67%

*San Francisco Bay Area Counties included: Alameda, Contra Costa, Napa, San Francisco, San Mateo, Santa Clara and Solano.

Note: Figures in parentheses refer to reported cases in 1968.

Source: State of California, Division of Labor Statistics and Research, *Doctor's First Report of Work Injury.* Statistics compiled by State of California, Department of Public Health.

perienced coworker is one explantion for his greater likelihood to develop dermatitis.

7. *Preventive measures:* More than half the physicians agree that the major preventive measure is avoidance of contact. This includes protective clothing such as gloves, better work technique, and appropriate protective creams. Engineering controls such as ventilation to exhaust volatile substances, equipment design changes, and substitution of less hazardous chemicals may be necesary.

Other recommendations include good personal hygiene, hand care, and the availability of suitable detergents for washups. Education of employees to the possible hazards of the job and ways they are to be avoided are stressed. One physician advises his patients to carry a clean, damp cloth in a plastic bag for use in cleaning contaminants from the skin.

8. *Assistance of county and state occupational health agencies:* Only seven of the dermatologists have ever used governmental agencies engaged in occupational health matters to assist in the investigation and management of their patients' work-related dermatoses.

9. *Further recommendations to aid in the prevention of occupational dermatoses:* A valid approach is to establish better liaison among the employers, insurance carriers, governmental health agencies (for example, industrial hygienists, safety officers), and medical and nursing personnel involved in the care of the workers. On-site visits are encouraged for the practicing dermatologist, ideally with an industrial health inspector. This would familiarize dermatologists with the nature of the specific occupational exposure. Appropriate measures to control any hazards observed could then be logically suggested. Safer materials should be used as substitutes for more potent irritants and sensitizers, whenever possible.

Since most plants are small, several might be able to mutually finance a full or part time industrial hygienist, or the functional equivalent. This could apply to a geographic area, or to a particular type of industry. It was noted that some employers and employees are ignorant of the dangers inherent in the job. This often leads to inadequate preventive measures.

Comment

It is logical to assume that board-certified, practicing dermatologists are in a unique position to comment authoritatively on occupational dermatoses. Unfortunately, it could not be determined from the "Doctor's First Report of Work Injury" what proportion of all reported occupational skin diseases is seen by dermatologists, who presumably could supply the best data for this study. Most workers are seen first by general practitioners.[2] In 1968, for example, 13,697 cases of occupational skin disease were reported to the California Department of Industrial Relations, Division of Labor Statistics and Research (Table 3). This figure represents 61 percent of the 19,512 cases of all reported types of occupational disease, excluding eye injuries and chemical burns.

About one-third of the dermatologists in seven San Francisco Bay Area counties responded to our survey. The respondents see approximately 80

new patients per week for a recognized occupational skin disorder. By extrapolation, about 250 people visit all Bay Area dermatologists each week for a work-related dermatosis. For a year the number of such patients would exceed 10,000. This is obviously a rough estimate. The total number of cases reported by all physicians in the seven Bay Area counties selected for this study was just under 2,500 (Table 3). Duplication of care and revisits must be considered. It is reasonable to conclude, nonetheless, that despite a fairly adequate reporting system in California, the actual number of job-related skin conditions exceeds those reported.

Contact dermatitis is the diagnosis made in most cases. No physician listed cases of pigmentary abnormalities, which are generally considered uncommon, and only one cited a specific tumor—actinic keratosis, a precancerous lesion. Chronic exposure to sun both at work and at play may lead to many alterations in the skin especially in susceptible persons. The terms *sailor's skin* and *farmer's skin* connote the tanning, wrinkling, atrophy, telangiectasia, precancerous conditions and cancers that develop.[3] Dark complexions, especially among Negroes, and Oriental skin are highly resistant to chronic sun damage and such degenerative sequelae.[4] In all areas of the country, contact dermatitis is the major occupational skin disease.[2,5,6] Yet, up to 20 percent of cases do involve such other mechanisms as microbial infection, physical injury, pigmentary changes and tumor formation.[7,8]

Certain diagnostic procedures, in addition to a detailed work history and physical examination, are used to assist dermatologists in establishing the exact cause of a dermatitis. About 90 percent of our responding physicians perform open and closed patch testing. The judicious selection and proper interpretation of such tests are often of inestimable value.[9,10] Skin scrapings for microbiologic organisms such as fungi, bacteria, and parasites are commonly done. Skin biopsy is performed less often.

The leading causes of occupational contact dermatitis listed in this survey were solvents, detergents and cleansers, and petroleum products such as lubricants, oils and greases. Rhus dermatitis (poison oak) is in sixth place, although it is first among reported occupational dermatoses in California.[1] Undoubtedly, most cases of poison oak are seen and reported by non-dermatologists. Since many cases of poison oak are never severe or long enduring or difficult to diagnose, specialist referral is probably low for this condition. Table 3 indicates that there is concordance in ranking of the leading five causes of occupational dermatoses in the Bay Area and in the state as a whole. This suggests that comparable work hazards confronted in the Bay Area may reflect those found state-wide, and that conclusions drawn on causes and prevention by our survey are likely applicable elsewhere in California.

A previous history of eczema or coexistent skin disease, particularly atopic dermatitis, is stressed as a predisposing factor in the development of occupational contact dermatitis. This observation is valid and merits general attention. The preemployment physical examination provides an opportunity to screen such individuals. It could thus assure both worker and employer that jobs would not be assigned which involve exposure to agents likely to produce contact dermatitis.

One matter of concern is the fear among some workers that reporting his suspected occupational dermatosis might jeopardize his job.

Measures taken to prevent occupational skin disease include suitable environmental controls and the highest standards of personal hygiene by well-informed workers. The major advice is still avoidance of contact between potentially injurious material and the skin.

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